

PHOTOPLETHYSMOGRAPHY WITH A SPATIALLY HOMOGENOUS MULTI-COLOR SOURCE

ABSTRACT OF THE DISCLOSURE

An apparatus for spatially homogenizing electromagnetic energy transmitted from different sources for measuring a physiological parameter. The apparatus includes a first inlet for receiving electromagnetic energy transmitted from a first source; a second inlet for receiving electromagnetic energy transmitted from a second source; a structure for spatially homogenizing the electromagnetic energy transmitted from the first source with the electromagnetic energy transmitted from the second source to form a spatially-homogenized multi-source electromagnetic energy; and an outlet for delivering the spatially-homogenized multi-source electromagnetic energy to a tissue location for measuring the physiological parameter. The structure for spatially homogenizing includes a first bundle of optical fibers having a first proximal end originating at the first inlet and a first distal end terminating at the outlet; a second bundle of optical fibers having a second proximal end originating at the second inlet and a second distal end terminating at the outlet; wherein at the outlet each first distal end of each fiber of the fibers of the first bundle is spatially mixed with each second distal end of each fiber of the fibers of the second bundle, so as to form a spatially-homogenized multi-source electromagnetic energy received from the first and the second inlets.

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